

SCHOOL VENTILATION. ITS EFFECT ON THE HEALTH OF THE PUPIL *

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SINCE the 1926 convention of the American Public Health Association, the committee has met but once, February 24, 1927, in New York City. This meeting was called for the purpose of considering various angles of the proposed comparative study of the effects of different types of ventilation on the health of school pupils in selected schools in Rochester, N. Y.

It will be recalled that early in 1926, the American Public Health Association, and the American Society of Heating and Ventilating Engineers were invited by the Fresh Air Indoors Committee of the Tuberculosis and Public Health Association of Rochester, N. Y., to collaborate with them in conducting this study in schools to be indicated by the board of education, and altered at the board's expense to conform to the highest standards of window-gravity ventilation on the one hand, and mechanical ventilation on the other.

In order that standards for interpreting the results of studies of this type might be established a National Central Conference Committee on School Ventilation was organized at a joint meeting of the Committees of the American Public Health Association and the American Society of Heating and Ventilating Engineers held in New York City, May 10, 1926. This Conference Committee was composed of representatives of the following organizations:

American Society of Heating and Ventilating Engineers	3 members
New York Commission on Ventilation	2 members
American Public Health Association	1 member
Joint Committee on Health Problems in Education, American Medical Association and National Education Association....	1 member

This group met June 21, 1926, for the purpose of organization and a preliminary discussion of procedures.

At the second meeting of this Central Conference Committee held in New York City, January 12, 1927, the following resolution was adopted:

RESOLVED that the questions which have been raised in regard to various methods of school ventilation can best be settled by studies of the actual results, methods and conditions obtaining in schools ventilated by different procedures and operated under different conditions.

Whereas, it is at present impossible for the Central Conference Committee to agree on analytical standards for judging of the quality of school room and air, therefore be it

RESOLVED that the problem may best be attacked in three phases.

1st—A study of the effect during the ventilation season (Nov. 1–March 30) on the health of school children of different school room atmospheric conditions as produced by different methods, judgment of the success of these methods to be based primarily on records of illness among pupils, particularly of respiratory diseases in relation to pupil sessions.

2nd—A collection of chemical and physical data on the atmospheric conditions which obtain with a correlation of same to data obtained under first paragraph above.

3rd—A study of the ventilation methods associated with the conditions found under 1 and 2.

If this program is approved by the Conference Committee on Ventilation,

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the Central Conference Committee will study the results obtained by various groups of investigators along the lines outlined in the resolution

(at Rochester, Syracuse, New Haven, etc.) and will report upon such results as they have accumulated. It was agreed that this resolution be placed before each of the members of the Conference Committee on School Ventilation by its representative member on the Central Conference Committee. After meeting with the approval of the members of the Conference Committee on School Ventilation this Central Conference Committee may proceed with the examination of data obtained in various school ventilation studies such as Syracuse and New Haven.

This resolution was endorsed by the American Public Health Association Committee at its meeting, February 24. It had been ratified by the New York State Committee on Ventilation at its meeting, January 24, 1927.

Other matters for special consideration at this meeting on February 24, are suggested in letters under date of February 21, 1927, from Raymond H. Greenman, Secretary of the Rochester Committee, to C. M. Baker, Chairman, which refer to the action of the Rochester Fresh Air Indoors Committee in tabling the recommendations they had prepared to submit to the Board of Education. Commenting on this action, Mr. Greenman states:

In taking this action, it was the sense of the Committee that they were not prepared to submit any recommendations to the Board of Education which involved the expenditure of a large amount necessary for alterations and additional equipment in the two schools as recommended by the two collaborating societies, until such time as the two societies were agreed on the objectives to be obtained in the test.

THE RATING TABLE

Another letter dealt with the "Rating Table" for evaluating the results of the study, submitted to the Rochester Committee by the Committee of the American Society of Heating and Ventilating Engineers.

In view of the previous endorsement of the resolution of the Central Conference

Committee, the committee rejected the use of the rating schedule proposed by the Heating and Ventilating Engineers, which not only was inconsistent with the resolution, in that it proposed to make air conditions the criterion of success rather than the effect on the health of the pupils, but was based on a series of arbitrary standards, the virtues of which were the subject of the investigation.

The attitude of one of the more prominent members of the Rochester Committee is illustrated by the following extract from this letter:

Mr. Tracy (superintendent of buildings and repairs) does not want to adopt any standard in the test which will modify the standards at present in use in the public schools, which call for dry bulb temperature 67 to 69 degrees, relative humidity at least 50 per cent, air exhaust over 300 cubic feet per minute.

After consideration of these matters, the Committee defined the following course of action:

1. The Committee is the proponent of no particular system of ventilation, but is open-minded on this question.

2. The Committee declines to participate in the Rochester Study if the "rating schedule" proposed by the ventilating engineers is employed.

3. The Committee must refrain from further action in the matter pending the final ratification or rejection of the resolution adopted by the Central Conference Committee, January 12, 1927.

On February 26, 1927, following the ratification of this resolution of the Central Conference Committee by your committee, the following letter was sent to W. H. Carrier, Chairman of the Central Conference Committee, by Professor Winslow:

My dear Mr. Carrier,

The agreement we reached at the Central Conference Committee in regard to criteria for school ventilation has been ratified by the New York State Commission, and by the A.P.H.A. Committee. I am somewhat disturbed to hear that there is opposition among the ventilating engineers to this criterion, as it seems to be the only possible compromise

on which the various parties concerned can hope to meet. We have all of us thrown away our preconceived notions and come down to the ultimate fundamental, the health of the child, and if the ventilating engineers cannot meet with us on this basis, I must confess that I can personally see no very hopeful prospects of further cooperation.

Sincerely yours,

C.-E. A. WINSLOW.

The fact that Mr. Carrier was rather seriously ill at this time probably accounts for the fact that there is no reply to the above letter. Under date of June 25, 1927, D. D. Kimball, the other member representing the New York Commission on the Central Conference Committee, received the following letter from Mr. Carrier:

Dear Mr. Kimball,

Thank you for your letter of June 11, regarding the committee work on ventilation.

I would advise that I have taken the matter up at the last meeting of the Central Conference Committee and they are not willing to endorse the proposed motion. In their viewpoint the situation so far as they are concerned is a deadlock.

I shall be able to advise you further after the semi-annual meeting next week.

Sincerely yours,

W. H. CARRIER, *Chairman*.

This action seems to preclude for the moment the possible joint participation of the representatives of the American Public Health Association and of the American Society of Heating and Ventilating Engineers in the proposed Rochester Study.

From the angle of the Rochester Committee, the following extract from a letter from the Superintendent of Schools, Herbert S. Weet, to Mr. Greenman, under date of June 28, 1927, is also of interest:

At the meeting of the Board of Education yesterday, your two letters concerning the next step in the matter of ventilation were presented and discussed. This whole thing comes at a time when our only sound course is to stand still. Our Building Department is so completely overwhelmed already with the repairs and other work connected with putting our buildings in shape for school in September that it will be unable to reach much of the things that have already been agreed upon. Further there is altogether too much involved in this undertaking to justify

any steps that would depend upon the scant consideration that it will be possible for us to give the subject before the opening of school in September.

STUDY DELAYED

Thus, the Rochester Study was "apparently arrested" in June, but lest there might have been some recent activity, in view of this meeting on September 29, I addressed to Mr. Greenman a request for "latest information regarding the status of the proposed study." To date (October 14, 1927) this letter has not been acknowledged.

Apart from the Rochester test, the Committee has been interested in the studies in New Haven, Syracuse and Cattaraugus County of the effects of different types of ventilation on the health of school pupils. The first of these has been conducted under the direction of Dr. Leonard Greenberg, while the latter two are field studies of the New York Commission on Ventilation.

NATURAL VENTILATION COMMENDED

The results of the New Haven and Syracuse studies, which were of a preliminary nature and should not be clothed with greater reliability than the methods warrant, are in agreement to an astonishing degree in confirming the findings of the New York State Commission on Ventilation, that from the angle of the health of the pupils, as indicated by the incidence of respiratory illness, natural ventilation (where local conditions permit its use), is superior to that accomplished by mechanical means under average conditions of operation.

These studies are being continued during the present school year under conditions that should produce thoroughly reliable data not only as to the incidence of respiratory illness but as to the air conditions as well.

In the Cattaraugus County Study, which was restricted to one and two room rural schools, the numbers of individuals under the various conditions were so small and the conditions so varied and

variable, that there was no apparent relationship between air conditions (as indicated by dry bulb temperatures) and respiratory illness among the pupils.

An impression of the air conditions in these rural schools may be gained from analysis of the data collected by the Commission's observers on the occasion of their visits to the schools.

The average temperatures were:

Ceiling	85.7° F.
Breathing level	69.7° F.
Floor	58.1° F.

or an excess of 27.6° F. at the ceiling over that at the floor.

A single observation showed the following temperatures at the different levels:

Ceiling	116° F.
Breathing level	77° F.
Floor	61° F.

The average of several observations in a single school showed temperatures at the 42 inch level to be 24° higher than at the floor. In another school the average of the ceiling temperatures was 102.5° F. while that at the breathing level was 77.8° F. or an excess of almost 25° F.

at the ceiling. These figures are cited to give a picture of the heat distribution vertically. Laterally, similar conditions exist and it will suffice to mention that in one school the temperature on top of one occupied desk was 40° F. lower than another in the same room.

The discovery of these conditions has led the Commission to the adoption of the following policy toward the Cattaraugus County Study during the coming winter:

1. The collection of data regarding dry bulb temperatures, health and attendance by the teachers will be continued.

2. These records will be supplemented by observations of relative humidity, floor, ceiling and desk top temperatures as frequently as is consistent with other phases of the program.

3. The major activity of the Commission's observers will be to collect data in some five or six schools in which by combinations of more adequate heating units with various types and degrees of weather proofing, a serious effort will be made to maintain air conditions generally considered more conducive to health than those found during the past year.

DR. LELAND O. HOWARD RESIGNS

DR. Leland O. Howard, a diligent contributor in the field of public health and for 33 years chief entomologist, Bureau of Entomology, United States Department of Agriculture, has resigned. For 50 years Dr. Howard has been in government service. He has passed his seventieth year and although he has asked to be relieved of administrative responsibilities as chief of the bureau he is not retiring from active service, but will continue his work in the field of entomological research. Medical entomology and parasitology are his special interests.

Dr. Howard has earned recognition in entomology by his investigations and he was a leader in the campaign for the elimination of the mosquito and in the anti-house-fly crusade.

Dr. Howard is a member of the National Academy of Sciences, the American Philo-

sophical Society, and the American Academy of Arts and Sciences. For 22 years he was permanent secretary of the American Association for the Advancement of Science and was its president in 1920-21. He has been elected to honorary membership in several foreign scientific societies and has the distinction of being the only American member of the Academy of Agriculture of France. He graduated from Cornell University where he received his bachelor of arts and masters of arts degrees. He received his Ph.D. and M.D. degrees from Georgetown University and honorary degrees of LL.D. from University of Pittsburgh and Sc.D. from University of Toronto.

Dr. C. L. Marlatt of the staff of the Bureau of Entomology since 1888 will succeed Dr. Howard.